

REMARKS UNDER 37 CFR § 1.111

Formal Matters

Claims 1-56, 80-90 and 92-101 are pending after entry of the amendments set forth herein.

Claims 1-56, 80-90 and 92-101 were examined. Claims 1-56, 80-90 and 92-101 were rejected.

Applicants respectfully request reconsideration of the application in view of the amendments and remarks made herein.

No new matter has been added.

The Office Action

Claims Rejected Under 35 U.S.C. Section 101

In the Official Action of November 14, 2008, claims 1-56, 80-90 and 92-101 were rejected under 35 U.S.C. Section 101 as being directed to non-statutory subject matter. The Examiner asserted that the rejected claims were method claims that recite a series of steps without a physical transformation, that the recitation of outputting to a display was an insignificant post-solution activity, and that the claims did not recited a tie to another statutory class of invention.

In response thereto, Applicants have amended the independent claims to tie them to another statutory class of invention, by reciting a computer-implemented or computer-facilitated method and by specifically reciting steps as being performed by computer.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1-56, 80-90 and 92-101 under 35 U.S.C. Section 101 as being directed to non-statutory subject matter, as being inappropriate.

Claims Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al.)

Claims 1-15 and 27-28 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-378) in view of Koleszar et al., U.S. Patent No. 6,519,583. The Examiner reiterated his assertions from the previous Office Action. In the

“Response to Arguments” section on pages 9-10 of the Office Action of 11/14/2008, the Examiner indicated that Applicants’ argument that Ben-Dor et al. does not additionally provide identifiers for locating the markers of Table 4, because the markers are the identifiers, was not persuasive because markers are not recited in the instant claims and because markers, by definition, specify locations of arbitrary gene or protein related data.

Applicants respectfully traverse. The Examiner asserted on page 6 of the Office Action dated 4/18/2008 that “The gene data is imported from the Whitehead Institute (the external source) as stated in the line bridging columns 1 and 2 of page 368 of Ben-Dor et al.”. Applicants have interpreted this statement as the Examiner asserting that the “arbitrary gene- or protein – related data” recited in the instant claims is considered to be met by the imported Whitehead Institute data”. If this assumption is incorrect, then Applicants request clarification by the Examiner.

If this assumption is correct, then it is respectfully submitted that the markers referred to by the Examiner do not identify the locations of the data from the Whitehead institute on the chromosome maps of Ben-Dor et al. At page 368, column 2, last full paragraph, Ben-Dor et al. discloses that they applied their algorithms to search for the best ordering with respect to the criteria because the true permutation is unknown. Further in support of this contention, Fig. 6 clearly shows that the markers do not identify where the data of the Whitehead Institute appears on the chromosome map of Ben-Dor et al.

Note that the chromosome maps of the Whitehead Institute are being considered by the Examiner to be the arbitrary gene- or protein-related data and therefore can not also be considered the chromosome maps referred to in the instant claims, as these are two different elements and it would make no sense to consider both of these elements as the Whitehead data, as this would result in the recited identifiers being the same as the recited pre-defined identifiers and would therefore result in matching the identifiers to themselves.

To still further clarify the distinctions of the present invention claim 1 has been amended to further recite reordering the gene- or protein-related data based on said matching the identifiers to an order matching the order of the predefined identifiers on said at least one of the chromosome maps. It is respectfully submitted that it would not have been obvious to reorder the Whitehead data, since this would result in producing an identical map to that provided by Ben-Dor et al., therefore making it very difficult, if not impossible, to analyze the differences between the two.

It is further respectfully submitted that Koleszar et al. also fails to teach or suggest importing arbitrary gene- or protein- related data and providing identifiers as claimed, reading the identifiers, matching the identifiers with predefined identifiers on at least one of the chromosome maps, reordering

the data as claimed, and displaying the arbitrary gene- or protein- related data adjacent positions on the at least one chromosome map where the genes associated with the respective arbitrary gene- or protein-related data are located, wherein all steps are automated steps, as claimed. Rather, Koleszar et al. teaches methods of graphically displaying computer-based biomolecular sequence information, which may be composed of nucleotide or amino acid sequence information, or both. Thus, Koleszar et al. appears to completely lack any disclosure of plotting this information adjacent chromosome maps. Nor does Ben-Dor et al. provide any teaching to map the information of Koleszar et al. adjacent a chromosome map. Accordingly, even if it would have been obvious to combine these references in the manner suggested by the Examiner, which Applicants do not agree that it would have been obvious, the resulting combination would still not meet all of the recitations of claim 1, for at least the reasons provided above.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1-15 and 27-28 under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-378) in view of Koleszar et al., U.S. Patent No. 6,519,583, as being inappropriate.

Claims Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al. and Stanyon et al.)

Claims 16, 18, 20-26, 29-33 and 55-56 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, as applied to claims 1-15 and 27-28 above, and further in view of Stanyon et al. (Cytogenics and Cell Genetics, volume 84, 1999, pages 150-155).

The Examiner reiterated his assertions from the previous Office Action. In the "Response to Arguments" section on pages 14-15 of the Office Action of 11/14/2008, the Examiner again asserted that Ben-Dor et al. teaches all of the claimed limitations of claim 1 and that the combination of references makes obvious the claimed invention. Applicants respectfully traverse, for at least the same reasons provided with regard to claim 1 above.

With regard to Stanyon et al., the Examiner asserted "A matrix is shown which compares the expression data between mouse and rat on page 153 of Stanyon et al....". Applicants respectfully submit that the matrix shown in Fig. 5, page 153 of Stanyon et al. is not an expression matrix, but is a modified Oxford grid. To further clarify this distinction, Applicants have amended claim 16 to recite

that the expression matrix has rows and columns, wherein each said row of said matrix contains data values for a particular gene or protein across a set of measured samples, and results of each said measured sample are provided by data in respective columns of said matrix. Claim 18 has been amended to recite that the data in a respective row of the matrix is associated with said particular gene. Support for these amendments can be found at paragraph [0076] of the specification for example, and throughout the specification and drawings.

Clearly the matrix of Fig. 5 of Stanyon et al. does not provide rows that contain data for a particular gene or protein, as many different genes are identified in each row. Also, the columns clearly do not each contain results of a measured sample, since one axis of the matrix of Stanyon et al. identifies rat chromosomes and the other axis identifies mouse chromosomes.

Still further, Stanyon et al. clearly does not disclose a matrix of at least one microarray of gene expression data. To the contrary, Stanyon et al. discloses at page 151, column 1, first full paragraph, that FISHJ was used to paint reciprocally rat and mouse metaphases.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 16, 18, 20-26, 29-33 and 55-56 under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, as applied to claims 1-15 and 27-28 above, and further in view of Stanyon et al. (Cytogenetics and Cell Genetics, volume 84, 1999, pages 150-155), as being inappropriate.

Claims Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al., Stanyon et al. and Singer et al.)

Claims 17 and 19 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583 and Stanyon et al. as applied to claims 1-16, 18, 20-33 and 55-56 above, and further in view of Singer et al. (U.S. Patent No. 5,866,331).

The Examiner reiterated his assertions from the previous Office Action. In the "Response to Arguments" section on page 17 of the Office Action of 11/14/2008, the Examiner again asserted that Ben-Dor et al. teaches all of the claimed limitations of claim 1 and that the combination of references makes obvious the claimed invention. Applicants respectfully traverse, for at least the same reasons provided with regard to claim 1 above.

In response to Applicants argument that Singer et al. does not cure the deficiencies of Ben-Dor et al., Koleszar et al. and Stanyon et al., the Examiner simply asserted that the combination of references make obvious the claimed invention.

Applicants respectfully traverse. It is respectfully submitted that none of the cited references disclose expression matrices as claimed. Claims 17 and 19 depend from claims 16 and 18 respectively, and, for at least the same reasons provided above why Stanyon et al. does not meet the recitations of claims 16 and 18, Singer et al. also does not meet the recitations of claims 17 and 19. The Examiner referred to Figs. 2A and 2B of Singer et al. as illustrating a plurality of heat maps. However, these are representative of a single cell, see column 4, lines 25-31. There is no disclosure or suggestion of providing an expression matrix having rows and columns, wherein each said row of said matrix contains data values for a particular gene or protein across a set of measured samples, and results of each said measured sample are provided by data in respective columns of said matrix. There is also no disclosure or suggestion of a matrix of at least one microarray of gene expression data, wherein each row of the matrix is associated with a particular gene, with data in the respective row being associated with said particular gene.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 17 and 19 under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583 and Stanyon et al. as applied to claims 1-16, 18, 20-33 and 55-56 above, and further in view of Singer et al. (U.S. Patent No. 5,866,331), as being inappropriate.

Claim Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al. and Bodzin et al.)

Claim 80 was rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-378) in view of Koleszar et al., U.S. Patent No. 6,519,583 as applied to claims 1-15 and 27-28 above, and further in view of Bodzin et al., US Patent publication No. 2003/0139886).

The Examiner reiterated his assertions from the previous Office Action. In the "Response to Arguments" section on pages 18-19 of the Office Action of 11/14/2008, the Examiner again asserted that Ben-Dor et al. teaches all of the claimed limitations of claim 1 and that the combination of references makes obvious the claimed invention. Applicants respectfully traverse, for at least the same

reasons provided with regard to claim 1 above.

Further, it is respectfully submitted that Bodzin et al. also fails to teach or suggest importing arbitrary gene- or protein- related data and providing identifiers as claimed, reading the identifiers, matching the identifiers with predefined identifiers on at least one of the chromosome maps, reordering the data as claimed and displaying the arbitrary gene- or protein- related data adjacent positions on the at least one chromosome map where the genes associated with the respective arbitrary gene- or protein- related data are located, wherein all steps are automated steps, as claimed. Rather, Bodzin et al. discloses multiplexing analysis software used to deconvolve and normalize colored assay data. Since Ben-Dor et al. does not appear to disclose use of colored assay data, it is respectfully submitted that there would have been no motivation to combine Bodzin et al. with Ben-Dor et al. Even if the references were combined as suggested by the Examiner, they would still fail to meet all of the limitations of claim 80, since Bodzin et al. fails to make up for the deficiencies of Ben-Dor et al. and Koleszar et al. for at least the reasons provided above.

The method of Ben-Dor et al. does not endeavor to match identifiers to predefined identifiers on a chromosome map. Quite the contrary, the method of Ben-Dor et al. endeavors to attempt to define an order to markers along a chromosome, using the algorithms disclosed. This is the opposite of predefined identifiers as claimed.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claim 80 under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-378) in view of Koleszar et al., U.S. Patent No. 6,519,583 as applied to claims 1-15 and 27-28 above, and further in view of Bodzin et al., US Patent publication No. 2003/0139886, as being inappropriate.

Claims Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al., Stanyon et al. and Bodzin et al.)

Claims 81-83, 85-87, 90 and 93-94 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, and in view of Stanyon et al. (Cytogenics and Cell Genetics, volume 84, 1999, pages 150-155) as applied to claims 1-16, 18, 20-33 and 55-56 above, and further in view of Bodzin et al., US Patent Publication No. 2003/0139886.

The Examiner reiterated his assertions from the previous Office Action. In the "Response to

Arguments” section on pages 20-21 of the Office Action of 11/14/2008, the Examiner again asserted that Ben-Dor et al. teaches all of the claimed limitations of claim 80 and that the combination of references makes obvious the claimed invention. Applicants respectfully traverse, for at least the same reasons provided with regard to claim 80 above.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 81-83, 85-87, 90 and 93-94 under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, and in view of Stanyon et al. (Cytogenics and Cell Genetics, volume 84, 1999, pages 150-155) as applied to claims 1-16, 18, 20-33 and 55-56 above, and further in view of Bodzin et al., US Patent Publication No. 2003/0139886), as being inappropriate.

Claims Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al., Stanyon et al., Bodzin et al. and McCully)

Claims 84 and 89 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, in view of Stanyon et al. (Cytogenics and Cell Genetics, volume 84, 1999, pages 150-155) and in view of Bodzin et al., US Patent Publication No. 2003/0139886, as applied to claims 1-16, 18, 20-33 and 55-56, 81-83, 85-87, 90 and 93-94 above, and further in view of McCully, U.S. Patent No. 4,383,994.

The Examiner reiterated his assertions from the previous Office Action. In the “Response to Arguments” section on page 23 of the Office Action of 11/14/2008, the Examiner asserted that Ben-Dor et al., Koleszar et al., Stanyon et al. and Bodzin et al. teach all of the argued limitations.

Initially, Applicants would point out that none of claims 1-16, 18, 20-23 and 55-56 have been rejected over Bodzin et al. and that therefore this ground of rejection, as stated, is improper.

Applicants respectfully traverse. As noted above, it is respectfully submitted that Ben-Dor et al. does not import arbitrary gene- or protein- related data and provide identifiers as claimed. read the identifiers, match the identifiers with predefined identifiers on at least one of the chromosome maps and display the arbitrary gene- or protein- related data adjacent positions on the at least one chromosome map where the genes associated with the respective arbitrary gene- or protein-related data are located, wherein all steps are automated steps, as claimed. Rather, Ben-Dor et al. discloses a method for ordering markers along a chromosome and estimating the physical distances between them, see page

365, column 1, lines 5-7 of the first paragraph after the abstract. Thus, it would not have been obvious to perform the matching of identifiers with pre-defined identifiers, since this would destroy the reason for the algorithms of Ben-Dor et al., which is to identify the order of location on the chromosomes, making it impossible to provide predefined identifiers as claimed.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 84 and 89 under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, in view of Stanyon et al. (Cytogenics and Cell Genetics, volume 84, 1999, pages 150-155) and in view of Bodzin et al., US Patent Publication No. 2003/0139886, as applied to claims 1-16, 18, 20-33, 55-56, 81-83, 85-87, 90 and 93-94 above, and further in view of McCully, U.S. Patent No. 4,383,994, as being inappropriate.

Claim Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al., Stanyon et al., Bodzin et al. and Anton)

Claim 92 was rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, in view of Stanyon et al. (Cytogenics and Cell Genetics, volume 84, 1999, pages 150-155) and in view of Bodzin et al., US Patent Publication No. 2003/0139886, as applied to claims 1-16, 18, 20-33 m 55-56, 81-83, 85-87, 90 and 93-94 above, and further in view of Anton, Elementary Linear Algebra, John Wiley and Sons: New York, 1987, pages 12-127.

The Examiner reiterated his assertions from the previous Office Action. In the "Response to Arguments" section on pages 25-26 of the Office Action of 11/14/2008, the Examiner again asserted that Ben-Dor et al., Koleszar et al., Stanyon et al. and Bodzin et al. teach and render obvious all of the claimed limitations of claim 80. Applicants respectfully traverse, for at least the same reasons provided with regard to claim 80 above.

Ben-Dor et al. discloses a method for ordering markers along a chromosome and estimating the physical distances between them, see page 365, column 1, lines 5-7 of the first paragraph after the abstract. Thus, it would not have been obvious to perform the matching of identifiers with pre-defined identifiers, since this would destroy the reason for the algorithms of Ben-Dor et al., which is to identify the order of location on the chromosomes, making it impossible to provide predefined identifiers as claimed.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claim 92 under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, in view of Stanyon et al. (Cytogenetics and Cell Genetics, volume 84, 1999, pages 150-155) and in view of Bodzin et al., US Patent Publication No. 2003/0139886, as applied to claims 1-16, 18, 20-33 m 55-56, 81-83, 85-87, 90 and 93-94 above, and further in view of Anton, Elementary Linear Algebra, John Wiley and Sons: New York, 1987, pages 12-127, as being inappropriate.

Claim Rejected Under 35 U.S.C. Section 103(a) (Ben-Dor et al. in view of Koleszar et al., Bodzin et al. and Pollack et al.)

Claims 90 and 93-94 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, in view of Bodzin et al., US Patent Publication No. 2003/0139886, as applied to claims 1-15, 27-28 and 80 above, and further in view of and in view of Pollack et al. (Nature Genetics, volume 23, 1999, pages 41-46).

Initially, Applicants would point out that none of claims 1-15 and 27-28 have been rejected over Bodzin et al. and that therefore this ground of rejection, as stated, is improper.

The Examiner asserted that Ben-Dor et al., Koleszar et al. and Bodzin et al. make obvious an automated method for mapping an matching genetic information. Applicants respectfully submit that this combination of references does not meet the recitations of claim 80 for the reasons provided above.

Ben-Dor et al. discloses a method for ordering markers along a chromosome and estimating the physical distances between them, see page 365, column 1, lines 5-7 of the first paragraph after the abstract. Thus, it would not have been obvious to perform the matching of identifiers with pre-defined identifiers, as claimed, since this would destroy the reason for the algorithms of Ben-Dor et al., which is to identify the order of location on the chromosomes, making it impossible to provide predefined identifiers as claimed.

It is respectfully submitted that Pollack et al. also fails to make up for the above-mentioned deficiencies.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 90 and 93-94 under 35 U.S.C. Section 103(a) as being

unpatentable over Ben-Dor et al. (Genome Research, 2000, volume 10, pages 365-278) in view of Koleszar et al., U.S. Patent No. 6,519,583, in view of Bodzin et al., US Patent Publication No. 2003/0139886, as applied to claims 1-15, 27-28 and 80 above, and further in view of and in view of Pollack et al. (Nature Genetics, volume 23, 1999, pages 41-46)., as being inappropriate.

Conclusion

Applicants submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone the undersigned at the number provided.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-1078, order number 10020503-2.

Respectfully submitted,

Date: February 17, 2009

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